On Statistics of Graph Energy

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The energy $E_G$ of a graph $G$ is the sum of the absolute values of the eigenvalues of $G$. In the case where $G$ is a molecular graph, $E_G$ is closely related to the total $\pi$-electron energy of the corresponding conjugated molecule. We determine the average value of the difference between the energy of two graphs, randomly chosen from the set of all graphs with $n$ vertices and $m$ edges. This result provides a criterion for deciding when two (molecular) graphs are almost coenergetic.

Key words: Energy (of graph); Total $\pi$-electron Energy; Coenergetic Graphs.